

# Automated Data Acquisition System from Industrial Machines

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## Abstract

© 2018 IEEE. The article describes an automated system of remote data collection from industrial machines at enterprises for the purpose of operative control of equipment loading (utilization rate) and analysis of the reasons for their idle time, as well as the measurement of power consumption. The data transmission system is based on Power Line Communication (data transmission via power lines). The principle of system construction is considered, its remote (peripheral) devices and the central control unit are described. The structural-functional diagrams, main technical characteristics and features of hardware and software implementation of the developed devices of the data acquisition system are given.

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## References

- [1] O. Severin, "How to increase production capacity at no extra cost", Production management, Russia, 2008, no. 2 (in Russian)-Access mode: <http://www.up-pro.ru/library/production-management/planning/kak-yvelichit.html>
- [2] I. E. Kryukov, I. N. Antonenko, "Automation of management of repairs and maintenance in the food industry", Food industry, Russia, 2009. No. 5, pp. 22-24. (in Russian)
- [3] [Electronic resource] Yu. Kurkova, A. Vasilyev, A. Lovygin, V. Stepanov. Monitoring systems for CNC machine tools in Russia. Technology and Market Overview for 2016 // Planeta CAM. Information-analytical electronic journal. 2016.-Access mode: <http://planetacam.ru/articles/market/sistemy-monitoringastankov-s-chu-v-rossiobzor-tekhnologiy-i-rynka2016g/>
- [4] [Electronic resource] Modern methods of production control // CADmaster. Information-analytical electronic journal. 3 (43). 2008.-Access mode: <http://www.cadmaster.ru/magazin/articles/cm-43-foreman.html>
- [5] [Electronic resource] How can an equipment monitoring system to change production // Production management. Information-analytical electronic journal. 2016.-Access mode: <http://www.up-pro.ru/library/information-systems/production/monitoring-proizvodstvo.html>
- [6] R. I. Shagiev, A. V. Karpov, S. A. Kalabanov, and R. R. Fatykhov, "Data management and data acquisition system based on GSM channel", Polzunov herald, Barnaul, Russia, 2013, No. 2, pp. 214-218. (in Russian)
- [7] S. A. Kalabanov, A. V. Karpov, R. S. Kirillov, and R. I. Shagiev, "Protection and control system for household electricity grid based on Smart Grid technology", Polzunov herald, Barnaul, Russia, 2011, no. 3-1, pp. 203-207. (in Russian)
- [8] R. I. Shagiev, A. V. Karpov, S. A. Kalabanov, R. A. Ishmuratov, and R. S. Syraev, "Energy-saving automatic heating system for car engines in winter conditions", Power engineering of Tatarstan, Kazan, Russia, 2015, no. 2, pp. 66-72. (in Russian)
- [9] Hendrik C. Ferreira Henricus M. Grove, Olaf Hooijen, A. J. Han Vinck, "Power Line Communication", Wiley Encyclopedia of Electrical and Electronics Engineering, 1999. [<https://doi.org/10.1002/047134608X.W2004>]
- [10] V. Okhrimenko, "PLC technology", Electronic components, Russia, 2009, no. 10-11, pp. 50-62. (in Russian)
- [11] [Electronic resource] The ATMEL polyphasic energy measurer-Access mode: <http://www.atmel.com/ru/ru/Images/Atmel-46004-SE-M90E36A-Datasheet.pdf>

- [12] [Electronic resource] Microcontroller with Yitran PLCmodem-Access mode: <http://www.yitran.com/index.aspx?id=3395>
- [13] [Electronic resource] Operating system FreeRTOS Reference Manual-API Functions and Configuration Options-Access mode: <http://www.freertos.org>
- [14] [Electronic resource] Interface converter ST3232 Series STMicroelectronics-Datasheet-Access mode: [http://www.st.com/web/en/resource/technical/document/data\\_sheet/CD00002253.pdf](http://www.st.com/web/en/resource/technical/document/data_sheet/CD00002253.pdf)
- [15] [Electronic resource] <https://www.embarcadero.com>-Official website of software developer.
- [16] [Electronic resource] Specifications of RFID reader 125 kHz model CP-Z-Access mode: <https://ironlogic.ru/il.nsf/pages/CPZ>